Brandeis University

# Health Policy Research Consortium

## DESIGN TRACKING SYSTEM FOR MONITORING THE IMPACT OF MEDICARE PHYSICIAN PAYMENT INITIATIVES

## FINAL REPORT

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## 1.0 OVERVIEW

Approximately 25 percent of total Medicare reimbursement is for physician services. Until recently however, there was no data base that allowed HCFA to analyze where these dollars were going. The implementation in 1983 of HCPCS, a single procedure coding scheme in place of codes specific to each of 54 carriers, made a comprehensive, nationally representative data base possible for the first time. The Part B Medicare Data File (BMAD) represents a comprehensive source of data to serve HCFA's internal needs as well as the needs of researchers and policy makers. The objectives of the data base are two-fold: first to allow HCFA to monitor changes in billing patterns and services provided over time; and second, to allow for comparisons of practice patterns across regions and/or physician specialties. It is also anticipated that the BMAD beneficiary claims files will be incorporated within the planned MADARS file. This file will merge Part A claims from the MEDPAR sample file with Part B claims as reported in BMAD.

In an era of increasing demand for physician payment reform, it is critical that there be a data base equal to the task of evaluating proposed policy options. The effects of the fee freeze and the Medicare participation agreement are but two examples of policies that may be monitored using BMAD. In addition, BMAD data may be used to formulate other reimbursement changes including the proposed RAP DRGs and the creation of a Relative Value Scale (RVS) as the basis of payment. The following report examines the 1984 BMAD submission; some of the problems discussed here have been addressed in the 1985 instructions to carriers. Where possible, these changes are noted.

### 1.1 Purpose of the Report

This report discusses the BMAD files I-IV which will be referred to as the BMAD Source Files and evaluates the ability of BMAD to analyze policy issues. The report also evaluates the 22 BMAD files developed by HCFA for internal analyses which are referred to as the 1984 BMAD Extract System. Comments herein refer to the 1984 version and may not apply to later BMAD Extract System versions. The report suggests uses of the BMAD source files including the specification of analytic files based on BMAD as well as the description of table formats for inclusion in a BMAD Data Book.

## 1.2 An Introduction to the BMAD Source Files

The BMAD data provided by the individual carriers is extracted from the existing claims processing history for Medicare patients. The BMAD data is provided by carriers in four separate formats as specified by HCFA.

| | | |
|---|---|---|
| BMAD | I | Procedure File |
| BMAD | II | Prevailing Charge File |
| BMAD | III | Provider File |
| BMAD | IV | Beneficiary File |

### BMAD I. Procedure File

The procedure file arrays all procedures (with modifiers) for which the carrier processed a claim during the calendar year and includes the related frequency and charge data. The data are arrayed by locality, specialty code, type of service (TOS), and place of service (POS). There is a record for each locality, specialty, TOS, and POS for each procedure/modifier. For example, there will be a record for initial comprehensive office visits (CPT-code 90020) by general practitioners and another for visits by internists. Similarly, for a procedure performed by internists in both the office and the outpatient department of a hospital, there will also be two records. The procedure file is designed to show an unduplicated count of the frequency that a procedure code/modifier occurred within the locality, specialty, TOS, and POS. Duplicate claims and adjustments should not be included in the frequency.

### BMAD II. Prevailing Charge File

The prevailing charge file includes the data generated during the reasonable charge update process. The file provides the prevailing charge limits for each service in the Procedure File BMAD (I). The data include the pricing or reasonable charge locality (RCL), the physician's participation status, and the specialty code used for profile development.

BMAD III. Provider File

The provider file reports the claims history data for all services rendered by the sampled providers including physicians and others (medical equipment suppliers). The size of the provider sample for 1985 was increased to five percent from the one percent sample drawn in 1984. The sample is drawn from all active providers. Active is defined as providers submitting at least one Medicare claim during the year. The sample size was increased in order to increase the statistical power, particularly for estimates within certain specialties. The process of selection for the provider sample is designed to assure continuity from year to year in the providers included in the sample and allows for replacement of inactive providers in subsequent years. Carriers were instructed to use SSN/EIN as the identifier.

BMAD IV. Beneficiary File

The final BMAD file is a compilation of all Part B claims for a five percent sample of beneficiaries. In addition to the five percent sample, HCFA also requested claims files for 100 percent of beneficiaries from selected carriers for the year 1984. The 100 percent files for the states of Alabama, Connecticut, Washington, Wisconsin, Maryland and Southern California which share the same format as the five percent files. The file reports the entire claims history of services received by each sampled beneficiary. The data included the date of service, type of service, (TOS) place of service (pos), specialty of the provider, and HCPC procedure code and modifier. The file also includes submitted charge, allowed charge, and reimbursement amount as well as an indicator if the procedure was taken on assignment and in 1985 and 1986, whether the provider is a participating physician.

## 1.3 Overview of the Report

Chapter 2 of the report includes a description of the BMAD source files as well as a discussion of the key limitations and problems with the BMAD data. Chapter 3 presents a similar discussion for each of the 1984 BMAD Extract System. This is followed by a presentation of suggested format changes to selected 1984 BMAD Extract System in chapter 4. The final chapter presents a rationale for the creation of a data book using BMAD data as well as suggested format for tables to be included in the data book.

## 2.0 THE BMAD SOURCE FILES (I-IV)

### 2.1 BMAD I. The Procedure File

BMAD I, the Procedure File, provides data for every procedure/modifier code processed by the carrier during the year. The file is designed to provide charge and frequency data for each procedure/modifier code according to locality, specialty, type of service, (TOS) and place of service (POS). The file contains for example, separate records for interpreting an ECG for general practitioners and for internists. It would also include a separate record for claims by general practitioners performing this service in the hospital and for those performing this service in their offices.

The file contains submitted charges, allowed charges, denied charges as well as frequency counts. Comparability of the data across carriers is limited by the lack of comparability in the specialty, type of service and place of service codes. Further problems are introduced by the continued use of "local codes" (i.e. W,Y,Z codes) that are carrier specific rather than HCPCS. These codes are compared in 2.5 below.

HCFA has designed BMAD to meet two disparate needs. First, the data are to be used to analyze effects of various payment policy options. Secondly, HCFA also would like the system to provide carrier workload data. Meeting these two conflicting goals may be problematic. Counts of procedures will include duplicate claims unless a screen can be incorporated to exclude duplicates from analytic files. A review of the 1984 BMAD files suggest that the carriers included duplicate and adjustment claims in the frequency counts. Instructions for 1985 emphasize that it should be an unduplicated count. If duplicates continue to be a problem, HCFA should reconsider its decision and revise the file to include only paid claims (excluding denials). Denials are not necessarily of policy interest since claims are frequently denied because the provider submits a duplicate claim.

### 2.2 The BMAD II. The Prevailing Charge File

The BMAD Prevailing Charge File includes, for every reasonable charge locality (RCL), the 50th percentile, the 75th percentile, and the adjusted

75th percentile for each procedure modifier code according to the specialty code. In data for 1985 and 1986, the file also provides the adjusted 75th percentile for both participating and for non-participating physicians.

Medicare UCR reimbursement method screens claims using the prevailing (defined as charges at the 75th percentile). The prevailing charge data represent the maximum amounts upon which reimbursement is based.

Data are provided according to the specialty code used for profile development which is not necessarily specific to each specialty providing the service. Hence a major shortcoming of the BMAD source files is that the specialty codes in BMAD Prevailing Charge File (II) may not link to the codes used in the BMAD Procedure File (I).

## 2.3 BMAD III. The Provider File

The BMAD III Provider File reports the complete claims history for a sample of active physicians/suppliers. In 1985, the size of the provider sample was increased from one to five percent. Providers who were included in the one percent sample are retained in the 1985 files if they were active during the year. A physician/supplier is active if they submitted at least one claim during the year. Providers selected in previous years will continue to be in the sample as long as they are active. The sample size has increased in order to provide sufficient observations for analysis at the regional or specialty level. While the increase in the sample size will improve the statistical power of the provider file, the sample is still quite small for some purposes. For example, there were 2052 thoracic surgeons (non federal in 1982) as reported by the AMA. A five percent sample would yield only about 103 nationwide, only some of which may treat Medicare patients. Thus analysis by region, for example, may not be possible.

The file includes, for each provider (use of an identification number is discussed in section 2.5), locality, specialty, zip code, and type of provider. The beneficiary HIC number, procedure code, type of service, place of service, and submitted, allowed and reimbursed amounts are provided for every claim submitted. An assignment indicator, incorporating participation status is included, as well as a payment indicator showing which payment screen (actual, prevailing, customary, other) was used to determine payment.

## 2.4 BMAD IV. The Beneficiary File

The BMAD IV Beneficiary File is the five percent sample history file. Included in the data file is the summary of all claims during the year for the sampled beneficiaries. In addition, BMAD IV includes the claims history for all End-Stage Renal Disease (ESRD) beneficiaries. The selection of the five percent sample uses the same criteria as that for the MEDPAR (Part A) sample in anticipation of a merged Part A and Part B data base in the future.

BMAD IV represents an extremely detailed and rich source of data with which to analyze Part B physician payment reforms. The file includes data on the beneficiaries' sex, the provider's reasonable charge locality (after 1985) and the provider's specialty. Details on the services include the procedure code, type of service, place of service, and date of service. The submitted charge and reimbursement amount are provided in addition to an assignment indicator.

The BMAD IV file, while offering great potential has also suffered from major definitional problems which have not been resolved in later versions of the file. The generic problems associated with each of the BMAD files are discussed in the following section.

## 2.5 Problems With BMAD Source Files (I-IV)

The following section describes the major problems and limitations we encountered in using 1984 BMAD (I-IV). Many of the problems are generic to the entire BMAD process while a few are specific to one file. The problem areas were identified in the 1984 BMAD submission and some were discussed during the preparation of instructions for the 1985 and 1986 BMAD submissions. Status of some of the revisions is unclear at this time.

The creation of analytic files using BMAD IV uncovered the following problems with the data, one specific to a single carrier, the remaining applying to the way that HCFA specified BMAD IV's creation.

### Problem Area 1: Omission of Reasonable Charge Locality (RCL) Data

The BMAD format omitted RCL, a key policy variable for the proposed analysis. This variable is routinely included in the claims history and represents a major shortcoming with BMAD. This variable is included in the 1985 BMAD IV.

Problem Area 2: Missing SSN/EIN Identifiers

In Wisconsin, a check of five hundred claims selected randomly showed that about 30 percent had no SSN/EIN identifier; that is, the field was filled with zeroes. Since the basis of our analyses is the individual physician, we asked the carrier to supply claims data from their history file rather than use BMAD. This problem may be remedied in the 1985 BMAD, since the edit requires 05, 20, 45, 70 or 95 as the terminal numeric characters.

Problem Area 3: Use of SSN/EIN as the Identifier

The instructions to carriers in 1984 was to use SSN/EIN as the identifier for the physician practice. The intent was to provide a unique identifier for each physician practice. It assumed that sole-practitioners would have a single SSN/EIN as would single specialty groups and multi-specialty groups (Spec=70). This assumption proved to be false.

An inquiry to one carrier revealed that it is common practice to maintain different specialty designations for physicians in a multi-specialty group, rather than using the specialty code "70". For maintaining profiles and for payment purposes, these physicians are separated. The requirement that BMAD IV use SSN/EIN as the identifier resulted in physicians with distinct provider IDs and different specialties who practice in a loosely organized group, being merged because they share the same SSN/EIN number for billing purposes. Data provided by Blue Cross Blue Shield of Alabama demonstrates that physicians within these groups can have different RCLs and different Provider IDs while sharing the same SSN/EIN. The problem may also seriously affect BMAD III, the provider file since the sampling routine, if done using the SSN/EIN seriously under-samples physician practices.

In BMAD for Alabama, (the 100% file) we found that the use of the SSN/EIN number underestimated the actual number of providers by as much as 25 percent. The problem was uncovered when the use of the crosswalk of Provider ID to SSN/EIN identifier, obtained from the carrier, revealed that many Provider IDs shared the same SSN/EIN. Moreover these providers represented a number of specialties and were located in different RCLs.

For example, the 800 physicians affiliated with the University Medical Center are profiled by specialty using their Provider ID, and correct payment is determined using the individual provider's own specialty and locality (RCL). However, the actual payee for the services of all 800 physicians is the group practice which has one EIN number, the identifier which appears on BMAD IV.

The claims history for this SSN/EIN showed the following:

| A Single SSN/EIN | | Specialty | Allowed Charges | Percent |
|---|---|---|---|---|
| xxx-xx-xxxx | 02 | General Surgeon | $215,143 | 12.3 |
| xxx-xx-xxxx | 08 | Family Practice | 45 | - |
| xxx-xx-xxxx | 10 | Gastroenterology | 89,560 | 5.1 |
| xxx-xx-xxxx | 11 | Internal Medicine | 455,996 | 26.1 |
| xxx-xx-xxxx | 16 | OB/Gyn | 8,604 | 0.5 |
| xxx-xx-xxxx | 18 | Ophthalmology | 595,235 | 34.1 |
| xxx-xx-xxxx | 20 | Orthopedic Surgery | 190,193 | 10.9 |
| xxx-xx-xxxx | 34 | Urology | 191,591 | 11.0 |
| xxx-xx-xxxx | 37 | Geriatrics | 340 | - |
| | | | $1,746,367 | |

In our aggregate files we found that physicians were providing services inconsistent with their specialty. For example, cardiovascular surgeons were billing for anesthesia services. The data also showed the surgeon assisting at his/her own operation. The use of the SSN/EIN number had linked two surgeons with different provider IDs who share a SSN/EIN identifier.

What are the implications of this practice? The use of SSN/EIN on BMAD IV imposes serious limitations on the use of the data for analytic purposes. Of particular concern is the ability of BMAD IV data to analyze individual physician behavior since physicians with differing specialty, RCL, and participation status are linked arbitrarily. The inclusion of RCL in 1985 BMAD may improve this situation somewhat since it would be possible to create physician aggregates according to unique combinations of SSN/EIN, specialty, and RCL. This practice may incorrectly link physician practices that in fact function independently. This would link practices with different provider IDs sharing the same SSN/EIN, specialty, and RCL who may be profiled separately and whose customary charges may be different. (See Problem Area 4.)

The 1985 instructions specify the use of the SSN/EIN as the identifier. "The SSN or EIN will be provided. Combine services of solo practicing physician suppliers with more than one identifying number. Group practices should show only services by the group provider ID."

Problem Area 4: Inaccuracy of the Payment Indicator

A close analysis of the payment indicator on BMAD IV showed a serious lack of consistency. An analysis was performed of the BMAD variable that indicates whether allowed charges were constrained by (1) submitted charges, (2) customary charges, (3) prevailing charges or (4) other. The analysis utilized the file for Maryland for lens, coronary bypass, and pacemaker procedures. For any given physician performing any given procedure, the submitted charges, the allowed charges, and the indications of the bases for the allowed charges were examined. In a number of cases, there appeared to be a random indication of submitted charges being constrained by customary versus prevailing screens. In other words, for a specific physician performing a specific procedure, there might be a number of bills, each with the same submitted charge and the same allowed charge, but on some bills there is an indication that the allowed was based on customary charges, and on others there are indications that the allowed was based on prevailing charges. This pattern was often completely random, with no relation to chronological order for example. In the worst case, this problem might apply to almost half of all frequent physician-procedure combinations. Far fewer problems appear to be present for the values of this variable that indicate an allowed charge was based on submitted charges or on some other basis. Consequently,it is not possible to determine from BMAD how frequently physician bills are constrained by the customary charges. These data are essential to any analysis which simulates the effects of removal of specialty or locality screens as has been proposed.

The instructions to carriers have been clarified on this point for the BMAD 1985 submission. In response to the new directive for the 1985 submission, carriers have identified one situation where it is not possible to identify the basis of payment, when the physician's

customary is equal to the area's prevailing. From a review of data for selected high volume procedures (i.e. lens insertion), this situation does not occur frequently.

Problem Area 5: Reasonable Charge Locality
The 1984 BMAD IV did not include the RCL used to determine correct payment.

The 1985 submission includes RCL on BMAD III/IV. However, the use of SSN/EIN as the identifier may prove problematic in the provider file. If the sample is drawn using SSN/EIN, in cases where physicians are in different localities, although sharing the same SSN/EIN, the RCL indicator will be incorrect.

## 2.6 Other BMAD Problems

More global problems with BMAD are due to the inconsistent use of codes by carriers. The inconsistencies apply to several different variables:

1. Inconsistent Procedure Codes
Carriers are not obligated to use HCPCS exclusively. They still have the right to pay for services identified by carrier specific local codes. Unfortunately these codes may represent some of the more frequently billed procedures. Comparisons of the frequency of a procedure (e.g. ECG interpretation only) across carriers is impossible since some states may use HCPCS while others do not. Lack of the appropriate HCPCS code doesn't mean that the procedure wasn't performed, rather it is "hidden" in a local code. While HCFA has asked carriers to submit documentation of local codes in 1985, experience suggests that these codes will probably not translate directly to a HCPCS code. In addition to local codes, a review of the BMAD 1984 submission indicates that the use of modifiers is somehow infrequent. In an otherwise consistent coding scheme, the omission of modifiers would not be too problematic. However, in some cases the 1984 BMAD Extract System, discussed in Chapter 3 of this report, depend on the modifier to identify type of service. (See discussion below.)

## 2. Inconsistent TOS and POS Codes

Another inconsistency that will likely improve over time is the non-uniformity of type of service (TOS) codes used. Examples of TOS codes taken from the documentation provided by carriers in four states is shown on Table 2-1. These codes, which are used in the 1984 and 1985 claims history differ across states and also differ from the HCFA codes. In many cases, it is not possible to re-classify using HCFA's BMAD codes in spite of the large number of codes as illustrated on Table 2-2. As shown in Appendix A, BMAD has a TOS code "F" for Ambulatory Surgery Centers (ASC), however, among the four, only Washington maintains a ASC code. From this we cannot conclude that the remaining states do not reimburse ASCs, rather, these charges are included with the "other" charges.

Some discrepancies in the use of place of service codes (POS) also exist (see Table 2-3) as do differences in physician specialty codes. Generally with carrier-supplied documentation, these codes can be successfully crosswalked to the BMAD codes. However, this is a time-consuming process for four states and a heroic task for all 54 carriers. Due to differences in carrier practices, even a perfect crosswalk of carrier to BMAD type of service codes will not yield fully comparable data. Carriers use different criteria to classify HCPCS codes into type of service categories. For example, in Connecticut, the carrier defines radio-inmunoassay tests as diagnostic x-ray service. (BMAD TOS = 5) while Alabama and Wisconsin are among the carriers that define these tests as pathology services (BMAD TOS = 6). Similar differences occur with other commonly performed services such as ECGs or diagnostic pacemaker services. One may correct for these inter-carrier differences in the process of creating analytic files by specifying the range of HCPCS codes to be included within the TOS categories. (i.e. Medical Codes in the 9000 range TOS = 1, Pathology Codes in the 8000 range TOS = 6.)

---

TABLE 2-1

COMPARISON OF TYPE OF SERVICE CODES

---

| | Type of Service Codes (TOS) | | | | |
|---|---|---|---|---|---|
| Service | Alabama | Connecticut | Washington | Wisconsin | BMAD |
| Medical Care | 6,A,B,C,M,N,G | 1,G | 1 | 1 | 1 |
| Surgery | 2,3,R | 2 | 2 | 2 | 2 |
| Consultation | 9 | 3 | 3 | 3,Y,Z | 3 |
| Radiology | 5,E,P | 4,6 | 4,6 | 4,6,E,G,H,M,X | 4 |
| Pathology | 3,1,P | 5,L,N | 5 | 5.D,F,L | 5 |
| Anesthesia | 4 | 7 | 7 | 7 | 7 |
| Assistant Surgery | 0 | 8 | 8 | 8 | 8 |

Source: Documentation supplied by carriers.

TABLE 2-2

COMPARISON OF BMAD TYPE OF SERVICE (TOS) CODES WITH CARRIER CODES

| Carrier | # of Codes | Medical Care 1 | Surgery 2 | Consult 3 | Diagnostic X-Ray 4 | Diagnostic Lab 5 | Radiation Therapy 6 | Anesthesia 7 | Assistant Surgeon 8 | Other Medical 9 | Blood 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alabama | 27 | X | X | X | X | X | X | X | X | | |
| New Jersey | 17 | X | X | X | X** | X** | X | X | X | | |
| Washington | 14 | X | X | X | X | X | X | X | X | X | |
| Wisconsin | 20 | X | X | X | X* | X | X | X | X | | |

| Carrier | # of Codes | Used DME A | ASC F | Renal Supplier L | Dialysis M | Kidney Donor N |
|---|---|---|---|---|---|---|
| Alabama | 27 | | | | | |
| New Jersey | 17 | | | | | |
| Washington | 14 | | X | X | | |
| Wisconsin | 20 | | | | | |

* "X" indicates that the carrier has a code consistent with the BMAD code

**Represents more than one TOS code.

## TABLE 2-3

## COMPARISON OF PLACE OF SERVICE CODES

| | Place Of Service Codes (POS) | | | | |
|---|---|---|---|---|---|
| Location | Alabama | Connecticut | Washington | Wisconsin | BMAD |
| Office | 3 | 1 | 1 | 1 | 1 |
| Home | 4 | 2 | 2 | 2 | 2 |
| Inpatient | 1 | 3 | 3 | 3 | 3 |
| SNF | 3 | 4 | 2 | 4 | 4 |
| Outpatient | 2 | 5 | 5 | 5 | 5 |
| Independent Lab | A | 6 | 6 | 6 | 6 |
| Other/Ambulance/Pharm | 0,9 | 7 | 7 | 7 | 7 |
| Nursing Home | 7 | 8 | 8 | 8 | 8 |
| Indep. Kidney Center | - | 9 | 9 | 9 | - |
| Ambulatory Surg Center (ASC) | B | - | A | 9 | 9 |
| Hospice | H | - | H | - | H |
| Day Care Psychiatric | 5 | - | - | - | |
| Night Psychiatric | 6 | - | - | - | |
| Dental Office | C | - | - | - | |
| Drug Abuse Residence | D | - | - | - | |
| Drug Abuse Outpatient | E | - | - | - | |
| Psychiatric Inpatient | F | - | - | - | |
| Hemophilia | G | - | - | - | |

Source: Documentation supplied by carriers.

## 3.0 1984 BMAD EXTRACT SYSTEM

### 3.1 Overview of the System Files

The four BMAD source files have been used as the basis of the 22 files in the 1984 BMAD Extract System. Several of the system files are designed to meet HCFA's specific needs (i.e. #20 Gap Fill Analysis File, #4 Medicare Directory File) while the remaining have more general research purposes.

The system files are summarized on Table 3-1 which shows the number of observations, unit of analysis as well as the BMAD source files that were used to create each of the 22 files. The provider file (BMAD III) was used to create a single system file (#9 the Locality Assignment File) while the procedure file (BMAD I) was the basis of 15 files either alone or with the prevailing charge file (BMAD II). Unfortunately, the procedure and prevailing charge files proved to be the most problematic in 1984 as discussed in the preceding chapter. In order to improve the quality of later BMAD submissions, HCFA has provided more detailed instructions and conducted workshops to assist carriers in preparing their BMAD submission.

The limitations and data problems associated with the BMAD source files (I-IV) as discussed in Chapter 2 above of course have a major effect on the validity of the 1984 BMAD Extract System. In addition, however, the system files also have serious limitations due to the way the files were specified.

### 3.2 The BMAD System Files

The following section provides the details for each of the BMAD Extract System files including size, description and limitations or problems with the file.

TABLE 3-1

SUMMARY OF 1984 BMAD EXTRACT SYSTEM

| BMAD Source File(s) | BMAD System File | No. of Records | Unit of Analysis | Aggregated By |
|---|---|---|---|---|
| Procedure File (I) | #8, Specialty Assignment File | 3,073 | MD SPEC | SPEC, TOS, POS |
| | #10, Carrier Procedure Summary | 260,000 | PROC CODE | CARRIER, PROC CODE |
| | #11, Procedure Summary (Nat'l) | 72,699 | PROC CODE | PROC CODE, MODIFIER |
| | #12, Expense File | 3,073 | SPEC | SPEC, TOS, POS |
| | #17, Procedure-Based Drug Anal. File (Extract of Procedure File) | 13,279 | PROC CODE | SPEC, MOD, CARRIER, TOS, POS |
| | #18, Procedure-Based DME Anal. File (Extract of Procedure File) | 33,534 | PROC CODE | SPEC, MOD, CARRIER, TOS, POS |
| | #21, Carrier Benefit Expense Analysis File | 82,148 | PROC CODE | CARRIER |
| | #22, Procedure Variations Summary File | 193,407 | PROC CODE | REGION MODIFIER |
| Procedure and Prevailing Charge Files (I, II) | #1, Special Interest Procedures | 3,700-5,000 | PROC CODE | PROC CODE, MOD, SPEC, CARRIER, LOCALITY, TOS |
| | #2, New Procedures | 20,000-30,000 | PROC CODE | (As above) |
| | #3, Obsolete Procedures | 4,000-5,000 | PROC CODE | (As above, except TOS) |
| | #4, Medicare Directory | 6,500-7,500 | PROC CODE | (As above) |

TABLE 3-1 (continued)

SUMMARY OF 1984 BMAD EXTRACT SYSTEM

| BMAD Source File(s) | BMAD System File | No. of Records | Unit of Analysis | Aggregated By |
|---|---|---|---|---|
| Procedure and Prevailing Charge Files (I, II) | #5, Procedure Groups File | 4,000-5,000 | PROC CODE | PROC CODE, MOD, SPEC, CARRIER, LOCALITY, TOS |
| | #13, Prevailing Charge Summary File | 31,839 | PROC CODE & MOD | PROC CODE, MOD, REGION |
| | #20, Gap Fill Analysis File | 21,655 | PROC CODE & MOD | PROC CODE, MOD, GAP-FILL SOURCE |
| Provider File (III) | #9, Locality Assignment File | 145 | CARRIER | SPEC, TOS, PROVIDER TYPE |
| Beneficiary File (IV) | #6, Basic and Related Procedures File | 1,000-2,000 | BENEFICIARY WITH BASIC PROCEDURE | |
| | #7, Beneficiary-Based Assignment File | 2,138 | SPEC | TOS, POS, PROVIDER TYPE |
| | #14, Beneficiary File | 45,293 | PROC & MOD | PROC, MOD, REGION |
| | #15, Beneficiary-Based Drug Analysis File | 54,412 | BENEFICIARY | |
| | #16, Beneficiary-Based DME File | 144,045 | BENEFICIARY | |
| | #19, Quarterly Expense Distribution File | 68 | CARRIER | QUARTER |

## FILE 1 Special Interest Procedures File

### Purpose

This file was designed to provide charge data on selected procedures that are of special policy interest. Examples of special interest procedures include coronary artery bypass grafts (CABG), lens implants (IOL), and pacemaker insertions.

### Description

Unit of Observation: Procedure Code - modifier in a locality

Number of Observations: 3,700 - 5,000

The data for each procedure-modifier includes, by specialty, the submitted charge, allowed charge, reimbursed amount, and denied amount. The file also provides a count of reimbursements and denied services. These data elements are combined for all places of service (POS) and types of services (TOS) in a locality. The prevailing charge is a weighted average over all types of services in the locality.

EXAMPLE. This file provides charge data for cardiologists in urban localities in Massachusetts (RCL=1) for the insertion of a permanent ventricular pacemaker (CPT-4 Code 33207).

### Problems and Limitations

The file, as constructed, fails to provide meaningful data for analysis because it combines the charge data for all places and types of services in a locality. For example, the charge data for pacemaker insertion will reflect an average of charges for the services of the surgeon, co-surgeon (if any), and assistant surgeon. Since the practice of using a co-surgeon or assistant

varies markedly by state, the values observed may reflect surgeon charges alone or the charges of several different physicians. Similarly, the frequency variable (MODFREQ) will reflect the number of physicians who submitted a claim for services related to a pacemaker insertion, rather than the unduplicated number of patients receiving the procedure.

Consistent use of modifiers with the CPT-4 code might alleviate many of the limitations inherent in this file because there would be a unique procedure modifier observation for claims for assistant surgeon (modifier code 80) and for two surgeons (modifier code 62). However, in practice, modifiers appear infrequently.

## FILE 2 New Procedures File

### Purpose

This file was designed to provide charge information on selected procedures that have been identified as "new" during the year. Procedures identified as new, such as lithotripsy, may be the result of new technology or regulatory changes which allow coverage for previously disallowed procedures.

### Description

Unit of Observation: Procedure Code - modifier

Number of Observations: 20,000 - 30,000

The data for each procedure/modifier (by carrier) includes by specialty the submitted charges, allowed charges, reimbursement amount, denied services, and denied amount. The file also provides frequency of reimbursement and frequency of procedures. These data are combined for all applicable places of service because the prevailing charge file does not include place of service.

EXAMPLE. The file provides reimbursement data for lithotripsy (CPT-4 Code 52337) to urologists by the carrier.

### Problems and Limitations

Analysis of this file is somewhat limited because the charge data are combined for all places and types of service. The charge data for an angioplasty (CPT-4 Codes 93570, 33570) for example, will reflect charges by the thoracic surgeon, and the assistant surgeon, etc. Because of the variation in the combination of types of service utilized in the procedure, the values observed may reflect the charges of the thoracic surgeon alone, or the charges of several physicians. As in File 1 the frequency variable will

reflect the number of physicians who submitted claims for services related to the angioplasty, rather than the number of patients actually receiving the procedure.

Combining by place of service also result in limitations for some procedures which are performed in several places of service. This is especially true for those surgical procedures which are being shifted from inpatient to outpatient departments (i.e., hernia repair (CPT-4 Code 49520), IOL insertion (CPT-4 Code 66980).

## FILE 3 Obsolete Procedures File

### Purpose

This file provides information on all procedures which have been identified as obsolete during the year. The procedures may be obsolete due to changes in technology or changes in regulations which prohibit reimbursement for previously allowed procedures.

### Description

Unit of Observation: Procedure Code

Number of Observations: 4,000 - 5,000

The data used is based on transaction date and identified by procedure code, modifier, and specialty. The data elements included, combined by place of service (POS), are frequency of procedure, submitted charge, allowed charge, reimbursement amount, denied services, and denied amount.

### Problems and Limitations

The data showing frequency, charges, denied services and denied charges are combined for all places of services. This practice will limit the usefulness of the file for analysis of procedures performed in several POS.

## FILE 4 Medicare Directory File

### Purpose

The purpose of this file is to use data from the Procedure and Prevailing Charge master files to provide information required for the publication of each year's Medicare Directory of Prevailing Charges.

### Description

Unit of Observation: Procedure Code

Number of Observations: 6,500-7,500

The data used to identify the selected procedures in the Medicare Directory are procedure code, modifier (if applicable), and specialty. Other data elements included in the file are region, carrier, locality, submitted charge, prevailing charge, allowed charge, denied services, denied amount, and source of adjustment. When several modifiers were combined for a specific procedure, weighted averages were constructed.

EXAMPLE. This file would provide average allowed charges paid by Prudential (NJ) for a bronchoscopy done in the hospital (CPT-4 Code 31620) to internists.

### Problems and Limitations

None.

## FILE 5 Procedure Groups File

### Purpose

This file was created in order to provide summary information on logically related groups of procedures. The groupings reported may not be apparent from the standard HCFA coding structures.

### Description

Unit of Observation: Procedure Code - modifier

Number of Observations: 4,000-5,000

The data combined to form specific procedure groups are assigned unique identifier codes and names. Each group contains up to ten combinations of procedure code, modifier, and specialty. Data included are submitted charge, allowed charge, denied services, denied amount, and procedure frequency. Frequency of procedure includes all places of service. For each locality, the frequency and prevailing charge figures are used to calculate the national weighted average prevailing charge.

### Problems and Limitations

None

## FILE 6 Basic and Related Procedures File

### Purpose

This file was designed to provide a linkage between selected basic and related procedures for all beneficiaries who received a designated basic procedure. In addition to allowing the user to identify both the basic and related procedures, the file also permits the specification of a time window for selecting the set of related procedures.

### Description

Unit of Observation: Beneficiary with Basic Procedure

Number of Observations: 1,000 - 2,000 (for each basic procedure.)

This file focuses on the beneficiaries receiving the user defined basic procedure as the unit of observation. In addition to the basic procedure, the file also searches for and identifies up to ten user-defined procedures related to the basic procedure. The basic and related procedures define a package of services. The user may also select the time frame for inclusion of any related procedure (i.e., ten days prior to the basic procedure and ten days following the procedure). Data for both basic and related procedure by type of service include: allowed charge, submitted charge, type of provider, and place of service. If a related procedure was received without the basic procedure, the record will not be extracted. If a basic procedure is performed (along with related procedures), more than once during a time frame, then duplicate records are created. The only data to be extracted are for records which contain valid HCPCS codes.

EXAMPLE. This file contains the total reimbursed amount for the basic and all related procedures for a beneficiary covered by Blue Shield of Pennsylvania for a coronary artery bypass graft (CABG CPT-4 Code 33504). Related procedures might include cardiac catheter stress tests, and consultation within seven days before and seven days following the surgery. The file also offers the analyst the ability to determine which related procedures were performed by the physician who performed the surgery. Pacemaker insertion, ECG, and pacemaker repair are also examples of basic and related procedures.

## Problems and Limitations

The basic procedure file is an extremely useful file for analysis of specific procedures (i.e., "overpriced" procedures). It may also prove very useful in evaluating differences in practice patterns by region or specialty. Because the file represents only 5 percent of beneficiaries, the frequency of certain procedures may be inadequate for analyses by state or region. The second limitation is more significant; the basic procedure is defined by a single HCPCS code. Hence, certain procedures that include a range of codes (i.e. CABGs or pacemakers) cannot be analyzed as a group.

## FILE 7 Beneficiary Based Assignment File

### Purpose

This file was designed to provide a summary for analysis of services provided on assignment for each physician specialty (i.e., internist, general surgeon), type of service (i.e., medical, radiology) place of service (i.e., office, hospital), and type of provider (i.e., physician, clinic, independent lab) combination.

### Description

Unit of Observation: Physician Specialty

Number of Observations: 2,138

The data in this beneficiary based file (based on a 5 percent sample of beneficiaries) is aggregated by specialty, type of service, provider type, and place of service. The file examines the assignment indicator fields to determine if; 1) the assignment was accepted, 2) the assignment was not accepted, or 3) all expenses were applied to the deductible. It then calculates totals for each of the three assignment classes described above for each of the defined categories,(i.e., for each specialty, TOS, type of provider combination). In addition, it calculates the totals for allowed charges for each of the defined categories.

EXAMPLE. This file provides the percent of allowed charges allowed taken on assignment for surgical services performed by cardiologists in the hospital. In addition, it also provides the proportion of all services taken on assignment by cardiologists for surgical services performed in the hospital.

### Problems and Limitations

None.

## FILE 8 Specialty Assignment File

### Purpose

Like the preceding file, this file was created in order to provide an analysis of assignment rates for each physician specialty. Rather than using the beneficiary file, this file is based on the procedure file. This file identifies categories of service with inappropriate prevailing charges by examining unusual assignment data. An unusually low assignment rate (i.e., few physicians take Medicare reimbursement as payment in full) suggests that the prevailing charge may be too low.

### Description

Unit of Observation: Physician Specialty

Number of Observations: 3,073

Each record on the file represents a combination of specialty, type of service, and place of service. Data reported include submitted charges, allowed charges, denied services, denied amount, procedure frequency, and assigned services. An assignment is included as the total percent of total charges taken on assignment.

EXAMPLE. This file provides the percentage of services taken on assignment by internists for medical services in the office and for medical services in the hospital. It is also possible to compare the assignment rates across surgical specialties (i.e., for surgical services in the hospital and /or the OPD and/or the office).

### Problems and Limitations

The assignment percent is defined as the number of services taken on assignment as a percent of the total. A more meaningful definition of assignment would be the percent of allowed charges taken on assignment. There is an apparent lack of consistency between the description of the file and the

file layout. The description of the file as based on records for each specialty, TOS, POS combination. The file layout indicates that the frequency variable combines the frequency for all POS, and submitted and allowed charges are combined for all POS and TOS. The usefulness of the file is determined by which format is actually used. A separate record for each specialty, TOS and POS combination would yield a far more meaningful measure of assignment behavior.

## FILE 9 Locality Assignment File

### Purpose

This file provides data necessary for the analysis of assignment rates for each locality. This allows for the analysis of unusual charges by locality and provider.

### Description

Unit of Observation: Carrier

Number of Observations: 145

These data are summarized by locality, specialty, and type of provider (TOP), type of service (TOS) combination. Each record contains region and carrier ID in addition to frequency of procedure, submitted charge, allowed charge, denied services, denied amount, and frequency of assignment for allowed procedures. These variables allow us to derive the number of assigned procedures as a percent of total procedures and the number of assigned charges as a percent of total allowed charges. Procedures having valid HCPCS procedure codes/modifiers are combined to reach the totals.

EXAMPLE. An extract from this file would give charges taken on assignment by orthopedic surgeons for surgical services in major metropolitan areas (locality 2) of Pennsylvania. It would also provide the number of services taken on assignment for surgical services performed by orthopedic surgeons in the same locality.

### Problems and Limitations

None

## FILE 10 Carrier Procedure Summary

### Purpose

This file was designed to provide national, regional, and carrier summaries for procedure specific data. It can be used to compare carrier specific assignment rates to regional and national trends.

### Description

Unit of Observation: Procedure Code

Number of Observations: 260,000

These data are summarized by procedure and carrier without regard for locality, modifier, specialty, place of service, or type of service. Summaries are provided for frequency, allowed charges, services assigned, services denied, amount denied, and procedure within carrier.

EXAMPLE. This file provides the number of claims submitted for hip replacement procedures (CPT-4 Code 27130) and amount reimbursed by Rhode Island Physicians Service. It also provides similar data for the New England states and for the nation.

### Problems and Limitations

This file allows for only limited analysis because the procedure frequency variable (MODFREQ) is combined for all types of service (TOS), and places and localities of service (POS and RCL). With this level of aggregation, variation observed across carriers may be due to differences in charges, as well as POS, specialty or other practice style differences (i.e. use of assistant surgeon). The file's size is also a major limitation.

## FILE 11 Procedure Summary File

### Purpose and Description

Unit of Observation: Procedure Code-Modifier

Number of Observations: 72,699

The purpose of this file is to produce summaries of frequency, submitted charges, allowed charges, reimbursement amounts, denied services, and denied amounts for each procedure-modifier. The data for each procedure-modifier are summarized without regard for specialty, place of service (POS), type of service (TOS), etc.

EXAMPLE. This file provides the average allowed charges for an aortoliac bypass graft (CPT 35541) regardless of who performed the procedure, where the procedure was performed or whether it was the surgeon, assistant, or anesthesiologist billing for the service.

### Problems and Limitations

The major flaw in this file is that it does not provide these summaries by type of service. With regional and local variations in provision of some types of services, these national summaries do not illustrate the reasons for the observed difference. For example, in some states, pacemaker insertion (CPT-4 Code 33207) is always performed with an assistant and in others an assistant is never included. The file is also limited in that it is not possible to combine related codes because the software does not permit specification of a range of codes.

## FILE 12 Expense File

### Purpose and Description

Unit of Observation: Physician Specialty

Number of Observations: 3,073

The purpose of this file is to provide national summaries of expense data aggregated by physician specialty, type of service, and place of service. Total number of procedures, submitted charges, allowed charges, reimbursement amounts, denied services, and denied amounts are provided for all combinations of specialty, type of service, and place of service. In addition, the number of procedures taken on assignment is also provided.

EXAMPLE. An extract from this file includes the total charge and reimbursed amount to cardiologists for consultation in the hospital as well as these data for consultation by cardiologists in the office.

### Problems and Limitations

This file provides data only on a national level rather than allowing for analyses within region or locality. As with all files based on the procedure file, due to TOS, POS and procedure code differences across carriers, the data are suspect.

## FILE 13 Prevailing Charge Summary File

### Purpose

This file was designed to provide various comparison of prevailing charges among regions for each procedure reported by the carriers.

### Description

Unit of Observation: Procedure Code-Modifier

Number of Observations: 31,839

The data, summarized by procedure, modifier, and region, include regional frequency, calculated regional average, and average adjusted and unadjusted prevailing charges. Regional average allowed charges are created by summing charges across all RCLs in the region and divided by the frequency of procedure in the region. National data are also provided. Railroad Retirement Board data are identified separately. Only those procedures with valid HCPCS codes are included in this file.

EXAMPLE. This file provides the average prevailing charge for intracapsular extraction of a dislocated lens (CPT 66930) in the Mid-Atlantic states.

### Problems and Limitations

There are problems analyzing all files based on BMAD I and BMAD II data, as a result of the use of carrier specific local codes. The use of specialty codes for BMAD I and II within a single carrier may not be consistent (see section 2.2.) Moreover, comparisons across regions will not be valid for a number of precedures.

## FILE 14 Beneficiary Expense Summary File

### Purpose and Description

Unit of Observation: Procedure Modifier

Number of Observations: 45,293

The purpose of this file is to provide expense data, summarized by region, for ESRD and non-ESRD beneficiaries. The file is organized by procedure-modifier, with regional totals provided for submitted charges, allowed charges, reimbursed amounts, and denied amounts for ESRD and non-ESRD beneficiaries.

EXAMPLE. This file provides total charges for non-ESRD beneficiaries for routine office visits (CPT-4 Code 90050) in each region. It also provides the same information for non-ESRD beneficiaries in each region. The file could be used to estimate per eligible expenses per region by dividing total charges, etc., by the number of eligibles in each region.

### Problems and Limitations

Because this file does not specify the type of service or place of service, the average values observed do not allow for detailed comparisons.

## FILE 15 Beneficiary Based Drug Analyses File

### Purpose and Description

Unit of Observation: Beneficiary

Number of Observations: 54,412

The purpose of this file is to provide data for the procedures which involve drugs. This file is based on the 5 percent beneficiary file. It is somewhat different from File 17, the Procedure Based Drug Analysis File, because it relates all drug use and charges for a given patient. This file is created by extracting those beneficiary records which have claims with HCPCS codes beginning with the letter "J" indicating a drug charge. Each record is summarized by HIC number, control number, carrier, and region. The file uses the beneficiary as the unit of analysis and shares the format of the beneficiary master record (BMAD IV).

### Problems and Limitations

The file is based on the 5 percent beneficiary file. While regional comparisons are possible, it is unclear whether those at the state level would be meaningful due to possible small sample sizes.

## FILE 16 Beneficiary Based DME Analysis File

### Purpose and Description

Unit of Observation: Beneficiary

Number of Observations: 144,045

This file was designed to provide a means of examining DME usage and costs. This file is based on the 5 percent beneficiary file. If differs from File 18, the Procedure Based DME Analysis File, in that it relates all DME usage and charges for a given beneficiary. The records included are those with HCPCS codes beginning with "E" and are aggregated by HIC number, control number, carrier, and region. Data include submitted charges, allowed charges, type of service, physician specialty, etc. Analysis of the data will allow determination of costs, time frames, etc. of disposable medical equipment usage for those beneficiaries who require DME. The record format is the same as that for the Beneficiary Master File (BMAD IV).

### Problems and Limitations

The file is based on the 5 percent beneficiary file. While regional comparisons of these data are possible, it is unlikely that state level analysis would be meaningful. The file is quite large and would be quite cumbersome to use. If the principal use of the file is to evaluate the timing of expenditures for DME equipment, the file could be respecified to aggregate charges for a specified number of days (i.e. the file could sum charges by the week, 2 weeks or month.)

## FILE 17 Procedure Based Drug Analysis File

### Purpose and Description

Unit of Observation: Procedure Code

Number of Observations: 13,279

This file was designed to provide data for analyses of drug related charges at the procedure level. The data, based on all records with HCPCS code beginning with "J," are aggregated by procedure/modifier, specialty, carrier, locality, place of service, and type of service. When compared to total claims filed, the number of drug claims is relatively small, representing five percent of the total sample. This, in turn, allows the extract file to be more detailed, and thus provides the user a greater freedom of analysis. One could use this file to compare the drug expense to the total expense per eligible.

EXAMPLE. This file provides the reimbursement amount in each state for specific drugs as identified on the file.

### Problems and Limitations

None

## FILE 18 Procedure Based DME Analysis File

### Purpose and Description

Unit of Observation: Procedure Code

Number of Observations: 33,354

This file was designed to provide data for analysis of DME usage at the procedure level. The data included (representing 2% of all procedures) are those with HCPCS codes beginning with "E" and are aggregated by procedure/modifier, specialty, carrier, locality, and type and place of service. Variables included on the file are submitted charges, allowed charges, denied services, denied amount, frequency of procedure, and assigned services. This file provides the reimbursement amount in each state and locality for a specific DME purchase as identified by the HCPCS code.

### Problems and Limitations

None. For comparative purposes, it would be useful to generate an average DME expense per eligible beneficiary.

## FILE 19 Quarterly Expense Distribution File

### Purpose and Description

Unit of Observation: Carrier

Number of Observations: 68

The function of this file is to provide a quarterly summary of expenses by region and carrier for ESRD and non-ESRD beneficiaries. In instances where the first and last expense date do not occur in the same quarter, expenses are prorated by the number of days in each quarter and apply to the respective quarterly summaries. The data, totalled separately for ESRD and non-ESRD beneficiaries, include submitted charges, allowed charges, denied amounts, and frequency of procedure reimbursements. These summaries allow for analysis of expenses with regard to quarterly variations. File 21, the Carrier Benefit Expense Analysis File, represents an aggregation of the quarterly summaries.

EXAMPLE. This file contains the total submitted and allowed charges for non ESRD beneficiaries living in Southern California for each quarter of 1984. It also provides provides the same data for the entire Pacific region.

### Problems and Limitations

While this file allows for comparison of carrier and regional expenses, because it does not specify type of service, place of service, or procedure, the comparisons are limited. It is possible to provide estimates of per capita expenditures by region by dividing by the number of eligibles. Because it is based on the 5 percent beneficiary sample, further disaggregation may not be possible.

## FILE 20 GAP Fill Analysis File

### Purpose and Description

Unit of Observation: Procedure Code and Modifier

Number of Observations: 21,655

The purpose of this file is to provide a summary of the procedure charges and assignment rate based upon how the prevailing charge was calculated for each procedure. If the prevailing charge (75 percent adjusted) was obtained from the 50th percentile for the procedure within the specific locality and specialty, then no gap filling procedure was used. Otherwise, gap filling procedures can be used to define the prevailing charge. The file contains data for each procedure/modifier; combining the gap fill and prevailing charge data from the Prevailing Charge Master File with the submitted charges and assignment data from the Procedure Master File (BMAD I). The file presents data without reference to region, carrier, or locality. The file is designed to evaluate each procedure according to the source of the prevailing in order to assess any effect of the source of the prevailing on provider behavior as measured by assignment rates.

### Problems and Limitations

File is not designed for analysis.

## FILE 21 Carrier Benefit Expense Analysis File

### Purpose and Description

Unit of Observation: Procedure Code

Number of Observations: 82,148

This file was designed to provide a summary of expenses for each carrier. The data include total frequency, submitted charge, allowed charge, denied services, and denied amount for each procedure (all modifiers are combined).

### Problems and Limitations

The file has a large number of cases, which makes it unwieldy for analysis. In addition, the aggregation of all TOS and POS further limit its usefulness. The file is designed to produce aggregate charge levels by procedure for each carrier which might then prove to be useful as a variable in other analyses.

## FILE 22 Procedure Variations Summary File

### Purpose

This file was created in order to provide regional and national averages for all records having valid HCPCS procedure codes.

### Description

Unit of Observation: Procedure Code

Number of Observations: 193,407

The date, summarized by procedure-modifier and region, include frequency, submitted charge, allowed charge, reimbursed amount, denied amount, and frequency of procedure taken on assignment In addition, a regional average is provided for each field. The national average is equal to the sum of the regional averages divided by the number of regions reporting the procedure. If the region does not report using HCPCS codes, the data fields are zero filled, and if the region does not report a specific procedure, the field are blank filled. In both instances the region is not counted in the national average. Data from the Railroad Retirement Board is included as a separate region.

EXAMPLE. This file provides national and regional average reimbursement amounts for CABGs (CPT-4 Code 33504) as well as average allowed charge for the same procedure by a specific carrier.

### Problems and Limitations

The limitations of this file are primarily the result of problems with the BMAD Procedure File (BMAD I) itself. Carriers do not necessarily use uniform codes. Duplicate claims were included, hence the files based on earlier BMAD submission are suspect. When these problems are resolved in the future submissions, the file format will be useful.

## 4.0 REVISION OF SELECTED BMAD SYSTEM FILES

### 4.1 Selection of Revised System Files

Decisions concerning the format of an analytic file are made with an understanding of the general purpose of the file. Analysis of across-area differences in allowed charges for a given procedure, for example, requires data that identify type of service (TOS), physician specialty, reasonable charge locality (RCL), and place of service (POS) because each of these elements are used in the determination of allowed charges. Many of the problems and limitations identified in the 1984 BMAD Extract System (as discussed in Chapter 3) are related to the chosen level of aggregation. Collapsing all specialties or even more serious, collapsing all types of service, obscures important determinants of the observed variation.

The BMAD source files (I-IV) provide charge data by: HCPCS code for the procedure (i.e., cholesystectomy or office visit); specialty (i.e., general surgeon); type of service (i.e., surgery, assistant surgeon, radiology), and place of service (i.e., inpatient hospital, outpatient hospital). Each of these elements is important.

Specialty differences are important because many services are provided by several specialties. Office visits, consultations, and hospital visits are provided by most physicians. While some surgical procedures are typically performed by a single specialty (i.e., intraocular lens (IOL) implant by ophthalmologists), many others are provided by several specialties. For example, pacemaker insertions are done by cardiologists, thoracic surgeons and general surgeons, and the provider's specialty is likely to influence the allowed charges.

Similarly, for some procedures like IOL implants that are provided in several settings (inpatient and outpatient) preserving POS is essential to analysis of relevant policy issues. However, the majority of surgeries are still done on an inpatient basis.

Type of service (TOS) distinctions are also important in the circumstance where physicians of the same specialty provide different kinds of services. For example, both the surgeon and assistant surgeon may be general surgeons. Since the allowed charge for assistant surgery may be as little as 20 percent of that for the surgeon, including both in the average charge by specialty would be extremely misleading.

A major case for inclusion of TOS in the analysis file is based on the special case of multi-specialty groups (spec = 70). All providers in these groups share the same specialty code, although members of the group have different specialties including radiologists, anesthesiologists, surgical specialties, and medical specialties. Without TOS, analysis is very limited for services provided by multi-specialty groups.

With these considerations in mind, the following discussion offers alternative file specifications that would be most appropriate for analysis of policy issues. The following section specifies changes in several existing BMAD System files. These files were selected for revision based on two considerations: first, the overall usefulness of the data presented as an analytic file; and secondly, the ability to enhance the files with modest changes in their format.

## 4.2 Special Interest Procedures File - BMAD 1*

Input File: BMAD IV Beneficiary File

Description: The special procedures file provides an opportunity to evaluate a number of surgical procedures (defined by one or more HCPCS codes), in order to examine the bundle of services related to the procedure. The analysis of the services provided is essential to the development of a global surgical fee. Further, these files might be expanded to examine services provided outside the hospitalization (either pre or post). The file will select the records from the Beneficiary File by HCPCS code. Since the Beneficiary File retains claims for all services billed for the sampled beneficiary, the file will also include claims data on all services defined as related to the procedure. The format of the BMAD IV file would be retained. In addition, the prevailing charge data would be merged on the file using the RCL of the physician (surgeon)performing the procedure.

---

*This format may also be used to replace BMAD 2, BMAD 3, and BMAD 6.

| Source | File Layout | |
|---|---|---|
| BMAD IV | CARR | Carrier ID |
| | HICNM | Beneficiary HIC number |
| | HCPCS | Procedure Code |
| | POS | Place of Service Code from surgeon's claim |
| | SURCHG | Surgeon's submitted charge for procedure (TOS=2) |
| | ASSCHG | Assistant surgeon's submitted charge for procedure (TOS=8) |
| | RADCHGS | Radiology charges for operative X-rays (pre-selected as related to procedure and with same dates of service) |
| | ANESCHG | Anesthesia submitted charge for procedure (TOS=4) |
| | SPEC | Surgeon's specialty |
| | SURCHGA | Allowed surgeon charge |
| | ASSCHGA | Allowed assistant surgeon charge |
| | ANESCHGA | Allowed anesthesia charge |
| | RADCHGA | Allowed radiology charge |
| | RCL | Reasonable charge locality of the surgeon |
| | TOTCHG | Total allowed charges related to the procedure |
| | TOTCHGA | Allowed charges taken on assignment |
| | PRESUR | Prevailing charge for surgeon (by Spec, RCL) |
| | PREASS | Prevailing charge for assistant surgeon (by Spec, RCL) |
| | PREANES | Prevailing charge for anesthesia (by RCL) |

---

## 4.3 Special Interest Procedures File - BMAD 1 (alternative)

Input File: Procedure File BMAD I

Description: The file will select the records from the Procedure File by HCPCS code, specialty, and TOS (and in some cases POS). The data from the Prevailing Charge File will also be merged by HCPCS, TOS (POS), specialty, and RCL. The formatted file for each carrier will show the aggregate charge data and unduplicated frequency for each TOS, specialty, and POS combination. These data will allow for descriptive analyses of the frequency and associated charges of each TOS, specialty, (and POS) combination.

## 4.4 Basic and Related Procedures File - BMAD 6

The objectives of this file may be satisfied by the format of the file described in 4.3 above.

## 4.5 Beneficiary Based Assignment File - BMAD 7

The purpose of this file is to provide estimates of assignment rates for physician services based on the beneficiary file. Assignment in the file would be defined as assignment accepted, not accepted, or all charges applied to the deductible. It would be of value to add an additional value indicating that the provider has signed the participation agreement.

| | |
|---|---|
| SPTOSPOS | Combination specialty, TOS, place of service (i.e. general surgeon, surgery, hospital)* |
| REIMBAMT | Total reimbursement amount |
| ASSCH1 | Sum of assigned charges-participating physicians |
| ASSCH2 | Sum of assigned charges-non participating physicians |
| ASSCH3 | Sum of non-assigned charges |
| ESRDAMT | Total reimbursement for ESRD patients |
| ASSCH1E | For ESRD, sum of assigned charges-participating physicians |
| ASSCH2E | For ESRD, sum of assigned charges-non participating physicians |
| ASSCH3E | For ESRD, sum of non-assigned charges |

## 4.6 Specialty Assignment File BMAD - 8

This file like BMAD 7 is also designed to provide specialty specific assignment rates. Alternatively this file uses the procedure file to generate similar numbers. Given the small sample sizes in some cells, using the procedure file would yield more reliable estimates. The combination of specialty, TOS, POS would also be the unit of analysis. The file will contain only paid claims (excluding duplicate and denied claims). It would be most useful to specify a number of high volume Medicare procedures and create a separate file for these procedures. For example, this file layout could be applied to a range of office visit codes, (CPT-4 codes 90000-90080) or to a selected surgical procedure (Transurethral prostatectomy CPT code 52601-52650).

| Source | File Layout | |
|---|---|---|
| BMADI | Carrier | Carrier ID |
| | SPTOSPOS | Specialty, place and type of service combination |
| | CHARGE | Total submitted charges for the Specialty, TOS, POS |
| | REASCH | Total reimbursement for the specialty, TOS, POS |
| | ASS1 | Sum of charges by participating physicians |
| | ASS2 | Sum of other charges not taken on assignment |

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*The combinations would be equal to the number of specialty codes x number of TOS codes x number of POS codes.

# 5.0 BMAD DATA BOOK

## 5.1 Rationale for a Data Book

While the BMAD source data offers a unique source of data concerning the billing for physican/other providers services for Medicare beneficiaries, the data files themselves are large and unwieldy. In order to provide access to the BMAD data for internal use, the 1984 BMAD Extract System (as described in Chapter 3) were created. These files are also problematic both due to the inherent BMAD difficulties as well as the way that the files were specified. The 22 system files are also large and unwieldy, and the data processing system lacks the necessary flexibility for analytic tasks.

In light of these concerns, The Center proposes that HCFA utilize the BMAD data in another fashion. A data book containing basic descriptive statistics would be enormously valuable to both HCFA staff and other researchers and policy makers. The format of the data book would depend on the intended audience. The following tables are suggested for inclusion in such a data book. The tables are designed with two points in mind: first that the data reflect the relative strengths of the BMAD data, and secondly, and that the data shown answer the broader data needs of the research and policy communities. Moreover, since these data will continue to be collected on an annual basis there is also the potential to expand the data book to include tables showing trends in physician expenditures over time.

## 5.2 Suggested Table Formats

The following table shells represent suggestions for inclusion in the data book, describing "Where Do Part-B dollars go?"

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TABLE

MEDICARE PART B EXPENDITURES BY TYPE OF SERVICE

---

|  | PERCENTAGE DISTRIBUTION |  |  |  |
|---|---|---|---|---|
|  | 1984 |  | 1985 |  |
| Type of Service | Charges | Allowed | Charges | Allowed |
| Medical Care |  |  |  |  |
| Surgery |  |  |  |  |
| Consultation |  |  |  |  |
| Radiology |  |  |  |  |
| Pathology |  |  |  |  |
| Anesthesia |  |  |  |  |
| Assistant Surgeon |  |  |  |  |
| Other |  |  |  |  |
|  | 100.0 | 100.0 | 100.0 | 100.0 |
| Total (in millions) |  |  |  |  |

Source: BMAD I Procedure File

THIS TABLE MAY ALSO BE PRODUCED SHOWING MEDICARE PART-B EXPENDITURES IN DOLLARS

## TABLE

## MEDICARE PART B EXPENDITURES BY PLACE OF SERVICE

| | PERCENTAGE DISTRIBUTION | | | |
|---|---|---|---|---|
| | 1984 | | 1985 | |
| Place of Service | Charges | Allowed | Charges | Allowed |
| Office | | | | |
| Home | | | | |
| Inpatient Hospital | | | | |
| SNF | | | | |
| Outpatient Hospital | | | | |
| Independent Lab | | | | |
| Hospice | | | | |
| Other | | | | |
| Total (in millions) | | | | |

Source: BMAD I Procedure File

THIS TABLE MAY ALSO BE PRODUCED SHOWING MEDICARE PART-B EXPENDITURES IN DOLLARS

## TABLE

## MEDICARE PART B EXPENDITURES PER CAPITA BY REGION

| | Part B Expenditures | | Part B Physician Expenditures | |
|---|---|---|---|---|
| Region | Total | Per Capita | Total | Per Capita |
| Northeast | | | | |
| Middle Atlantic | | | | |
| East North Central | | | | |
| South Atlantic | | | | |
| East South Central | | | | |
| West South Central | | | | |
| Mountain | | | | |
| Pacific | | | | |
| Total U.S. | | | | |

Source: BMAD IV The Beneficiary File

THIS TABLE FORMAT MAY ALSO SHOW DATA FOR EACH STATE AND BY ELDERLY, DISABLED, AND ESRD PATIENTS.

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TABLE

MEDICARE PART B SUBMITTED AND ALLOWED CHARGES (IN MILLIONS) BY PHYSICIAN SPECIALTY

| Physician Specialty | Submitted Charges | Allowed Charges | Percent of Services Assigned |
|---|---|---|---|
| General Practice (GP) | | | |
| Family Practitioners | | | |
| General Surgeon | | | |
| Anesthesiologist | | | |
| Cardiologist | | | |
| Internists | | | |
| Neurologists | | | |
| OB/Gynecologist | | | |
| Opthalmologist | | | |
| Orthopedist | | | |
| Pathologist | | | |
| Radiologist | | | |
| Thoracic Surgeon | | | |
| Urologist | | | |
| Other | | | |

Source: BMAD I Procedure File

THIS TABLE MAY BE PRODUCED FOR EACH REGION AND FOR SOME SPECIALTIES BY STATE

1116H/12H

TABLE

WHAT DO OPHTHALMOLOGISTS DO? (Percent of Medicare Revenues)

| | | REGION | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | U S | NE | MA | ENC | UNC | SA | ESC | MNT | PAC |
| Office Visits | | | | | | | | | |
| Eye Exams | | | | | | | | | |
| Consultations | | | | | | | | | |
| Other Visits | | | | | | | | | |
| Cataract Extraction with IOL Implant | | | | | | | | | |
| Cataract Extraction Only | | | | | | | | | |
| IOL Implant Only | | | | | | | | | |
| Dissection of Secondary Cataract | | | | | | | | | |
| Laser Photocoagulation | | | | | | | | | |
| Excision of Chalazion | | | | | | | | | |
| Other Surgery | | | | | | | | | |
| Ophthalmic Ultrasound | | | | | | | | | |
| Other X-Rays | | | | | | | | | |
| Assistance at Surgery | | | | | | | | | |
| Tests | | | | | | | | | |
| Total $ (Millions) | | | | | | | | | |

Source: BMAD III Provider File.

THIS TABLE FORMAT MAY ALSO BE PRODUCED SHOWING TIME SERIES DATA.

TABLE

WHAT DO UROLOGISTS DO? (Percent of Medicare Revenues)

| | | REGION | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | U S | NE | MA | ENC | UNC | SA | ESC | MNT | PAC |
| Office Visits | | | | | | | | | |
| Hospital Visits | | | | | | | | | |
| Consultations | | | | | | | | | |
| Cystourethroscopy | | | | | | | | | |
| TURP | | | | | | | | | |
| Suprapubic Prostatectory | | | | | | | | | |
| Prostate Biopsy | | | | | | | | | |
| Other Surgery | | | | | | | | | |
| Assistance at Surgery | | | | | | | | | |
| X-Rays | | | | | | | | | |
| Lab Tests | | | | | | | | | |
| Total $ (millions) | | | | | | | | | |

Source: BMAD III Provider File.

THIS TABLE FORMAT MAY ALSO BE PRODUCED SHOWING TIME SERIES DATA.

1116H/12H

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TABLE

AVERAGE MEDICARE ALLOWED CHARGES FOR HIGH VOLUME SURGICAL PROCEDURES

---

| | | REGION | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | U S | NE | MA | ENC | UNC | SA | ESC | MNT | PAC |
| General Surgeons | | | | | | | | | |
| Mastectomy (19240) | | | | | | | | | |
| Pacemaker insertion, atrial (33206) | | | | | | | | | |
| Pacemaker insertion, ventricular (33207) | | | | | | | | | |
| Pacemaker insertion, AV (33208) | | | | | | | | | |
| Thromboendarterectomy, carotid (35301) | | | | | | | | | |
| Partial colectomy (44140) | | | | | | | | | |
| Cholecystectomy (47600) | | | | | | | | | |
| Cholecystectomy w/cholangiography(47605) | | | | | | | | | |
| Cholecystectomy w/CDE (47610) | | | | | | | | | |
| Exploratory laparotomy (49000) | | | | | | | | | |
| Inguinal hernia repair (49505) | | | | | | | | | |
| Cardiologists | | | | | | | | | |
| Left heart catheterization (93547) | | | | | | | | | |
| Right & left heart catheterization (93549) | | | | | | | | | |
| Pacemaker insertion (33206) | | | | | | | | | |
| Pacemaker insertion (33207) | | | | | | | | | |
| Pacemaker insertion (33208) | | | | | | | | | |
| Neurosurgeons | | | | | | | | | |
| Thromboendarterectomy (35301) | | | | | | | | | |
| Craniectomy for hematoma (61310) | | | | | | | | | |
| Laminectomy, lumbar (63005) | | | | | | | | | |
| Laminotomy for disc (63030) | | | | | | | | | |
| Craniectomy for tumor (61510) | | | | | | | | | |

TABLE (continued)

AVERAGE MEDICARE ALLOWED CHARGES FOR HIGH VOLUME SURGICAL PROCEDURES

| | | REGION | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | US | NE | MA | ENC | UNC | SA | ESC | MNT | PAC |
| OB-GYNs | | | | | | | | | |
| Total hysterectomy (58150) | | | | | | | | | |
| Vaginal hysterectomy (58260) | | | | | | | | | |
| Vaginal hysterectomy w/ repair (58265) | | | | | | | | | |
| Ophthalmologists | | | | | | | | | |
| Fistulization of sclera (66170) | | | | | | | | | |
| Lens extraction, intracapsular (66920) | | | | | | | | | |
| Lens extraction & IOL implant (66980) | | | | | | | | | |
| IOL implant only (66985) | | | | | | | | | |
| Orthopedic Surgeons | | | | | | | | | |
| Arthroplasty, prosthesis (27125) | | | | | | | | | |
| Total hip replacement, simple (27130) | | | | | | | | | |
| Total hip replacement, complex (27131) | | | | | | | | | |
| Femoral fx w/internal fixation (27236) | | | | | | | | | |
| Femoral fx w/internal fixation (27244) | | | | | | | | | |
| Total knee replacement (27447) | | | | | | | | | |
| Thoracic Surgeons | | | | | | | | | |
| Pacemaker insertion (33206) | | | | | | | | | |
| Pacemaker insertion (33207) | | | | | | | | | |
| Pacemaker insertion (33208) | | | | | | | | | |

TABLE (continued)

AVERAGE MEDICARE ALLOWED CHARGES FOR HIGH VOLUME SURGICAL PROCEDURES

| | | REGION | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | US | NE | MA | ENC | UNC | SA | ESC | MNT | PAC |
| CABG, single artery (33510) | | | | | | | | | |
| CABG, 2 arteries (33511) | | | | | | | | | |
| CABG, 3 arteries (33512) | | | | | | | | | |
| CABG, 4 arteries (33513) | | | | | | | | | |
| CABG, 5 arteries (33514) | | | | | | | | | |
| CABG, 6+ arteries (33516) | | | | | | | | | |
| Thromboendarterectomy (35301) | | | | | | | | | |
| Urologists | | | | | | | | | |
| TURP (52601) | | | | | | | | | |
| Prostatectomy, suprapubic (55821) | | | | | | | | | |

Source: BMAD I Procedure File.

THE DATA MAY BE ALSO SHOWN BY STATE.

1116H/12H

TABLE

COMPARISON OF UTILIZATION OF INPATIENT SERVICES RELATED TO PACEMAKER INSERTION

| | GS | CARDIO-LOGIST | THORACIC SURGEON | OTHER | ALL PHYSICIANS |
|---|---|---|---|---|---|
| Pacemaker Insertion | | | | | |
| Repair/Revision | | | | | |
| Anesthesia | | | | | |
| Asst. Surgeon | | | | | |
| ECG | | | | | |
| Electronic Analysis | | | | | |
| Radiology | | | | | |
| Laboratory | | | | | |
| Visits | | | | | |
| Consults | | | | | |
| Other Surgery | | | | | |

Source: BMAD IV Beneficiary File.

# REFERENCES

Department of Health and Human Services, Health Care Financing Administration, Bureau of Data Management and Strategy. Users Manual Part B Medicare Annual Data System (BMAD).

# APPENDIX A - Type of Service Codes

## APPENDIX A

## TYPE OF SERVICE CODES

| BMAD | ALABAMA | WASHINGTON | NEW JERSEY | WISCONSIN |
|---|---|---|---|---|
| 1=Medical Care | 0=Asst. Surgeon | 1=Medical | 1=Medical | 1=Medical |
| 2=Surgery | 2=Surgery | 2=Surgery | 2=Surgery | 2=Surgery |
| 3=Consultation | 3=Maternity | 3=Consultation | 3=Consultation | 3=Consultation |
| 4=Diagnostic X-ray | 4=Anesthesia | 4=Diagnostic X-ray | 4=Diagnostic X-ray | 4=X-ray Office |
| 5=Diagnostic Lab | 5=X-ray | 5=Diagnostic Lab | 5=Diagnostic Lab | 5=Ultrasound, Lab |
| 6=Radiation Therapy | 6=Medical | 6=Radiation Therapy | 6=Radiation Therapy | 6=Radiation Therapy |
| 7=Anesthesia | 7=Dental | 7=Anesthesia | 7=Anesthesia | 7=Anesthesia |
| 8=Assistance | 8=Lab | 8=Assistance at Surg. | 8=Assistant Surgery | 8=Assistant Surgery |
| 9=Other Medical | 9=Consult | 9=Other Medical | 9=Other Medical | 9=Other Services (drugs) |
| 0=Blood | | | 0=Blood | |
| A=Used DME | A=Accident | | | A=Durable Medical Equip. |
| | B=Concurrent Care | | B=Ambulance | |
| | C=Psychiatric Care | | C=DME Rental | |
| | D=PT | | D=DME Purchase | D=Pathology |
| | E=X-ray, Therapeutic | | | E=X-ray, Interpretation |
| F=ASC | F=Ambulance | F=ASCF | | F=Laboratory |
| | G=DME Purchase | | | G=Radiation Therapy |
| | H=DME Rental | | | H=X-ray Total |
| | I=Oral Surgery | | | |
| | J=Home Care | | | |
| L=Renal Supplier | L=Visiting Nurses | L=Renal Supply | L=Hospital Lab | |
| M=Dialysis | M=Vision Care | | | M=X-ray Tech. Component |
| N=Kidney Donor | N=Pulminary TB | | N=Purchased Lab | |
| | P=Prof'l. Component | P=DME Purchase | P=Radiology-Nonhospital | |
| | Q=Chemotherapy | | | |
| | R=Donor Surgery | R=DME Rental | R=Interpretive Lab | R=Rental/Durable Equip. |
| | T=RIA | | | |
| | U=Supp. Acid | | | |
| | | V=Pneumococcal Vaccine | | |
| | | | | X=Ultrasound |
| | | | | Y=Second Opinion Consult |
| | | | | Z=Third Opinion Consult |

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